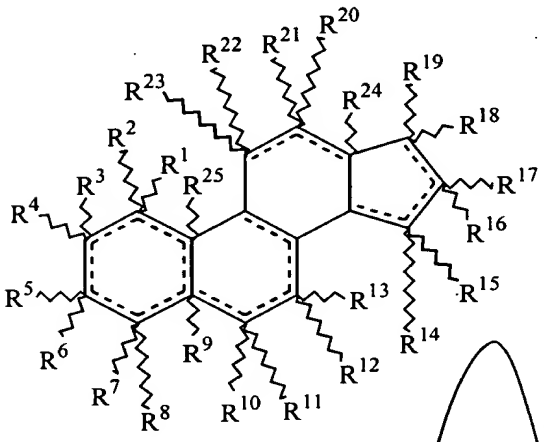
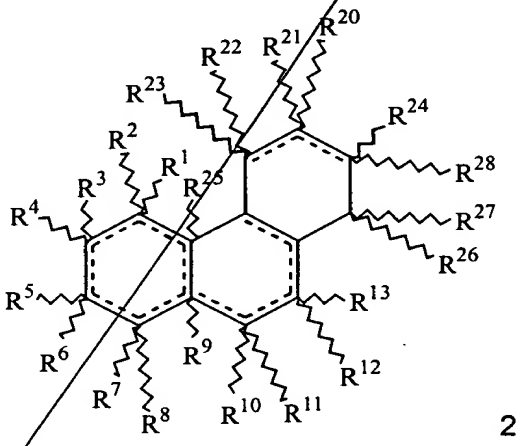
CLAIMS

What is claimed is:

1. A method to treat or prevent an androgen responsive disease in a subject, or to ameliorate one or more symptoms thereof, comprising administering to a subject, or delivering to the subject's tissues, an effective amount of a compound of formula 1 or 2



1



2

wherein, R^1-R^{28} independently are -H, -OR^{PR}, -SR^{PR}, -$N(R^{PR})_2$, -O-Si-$(R^A)_3$, -CN, -NO_2, -OSO_3H, -OPO_3H, an ester, a phosphoester, a phosphonoester, a sulfite ester, a sulfate ester, an amide, an amino acid, a peptide, an ether, a thioether, an acyl group, a carbonate, a carbamate, a sulfonamide, a halogen, an optionally substituted alkyl group, an optionally substituted alkenyl group, an optionally substituted alkynyl group, an optionally substituted aryl moiety, an optionally substituted heterocycle, an optionally substituted heteroaryl moiety, an optionally substituted monosaccharide, an optionally substituted oligosaccharide, a nucleoside, a nucleotide, an oligonucleotide, a polymer, or, when two of R^1-R^{28} are linked to the same carbon atom (e.g., R^5 and R^6 or R^{12} and R^{13}), they independently comprise a double bond, such as =O, =S, =CH_2 or =N-OH, at one or more ring carbons, and provided that when one or more of the rings comprises a double bond, one of the variable groups that is bonded to the double bonded ring carbon is absent; each R^A independently is C_{1-8} alkyl; each R^{PR} independently is -H or a protecting group; and the dotted lines

are optional double bonds, provided that 2, 3, 4 or more of R^1-R^{28} are not hydrogen, and provided that compound is not 17α-ethynyl-17β-hydroxy-4-estrene-3-one, 17α-ethynyl-17β-hydroxy-5(10)-estrene-3-one, 1, 3, 5(10)-estratriene-17α-ethynyl-3β,17β-diol, 17α-ethynyl-androst-5-ene-3β,17β-diol, 17α-ethynyl-17β-hydroxy-4-androsten-3-one, 3β,17β-dihydroxy-androst-5-en-16-one, 3β,17β-dihydroxy-androst-4-en,3β,-methylcarbonate-androst-5-en-7,17-dione, 3β,17β-dihydroxy-androst-5-en-11-one, 3β,17β-diacetoxy-androst-5-ene-7α,17β-diol, 3β,17β-diacetoxy-androst-5-ene-7-one, 3β-methoxy-androst-5-ene-7α,17β-diol, 17β-methoxy-androst-3,5-diene-7-one, 17β-hydroxy-androst-3,5-diene-7-one, 5α-androstane-3α,17β-diol or an an ester, ether or salt of any of these compounds.

2. The method of claim 1 wherein the androgen responsive disease is prostate cancer, benign prostatic hyperplasia, breast cancer, alopecia, acne, hypogonadism or hirsutism.

3. The method of claim 1 wherein the formula 1 or formula 2 compound is a compound or genus of compounds named in compound groups 1 through 13-11 as disclosed herein.

4. The method of claim 1 wherein the subject is a human.

5. The method of claim 1 wherein the formula 1 or formula 2 compound is present in a composition that comprises a pharmaceutically acceptable carrier.

6. The method of claim 1 wherein the method further comprises administering to the subject a second therapy.

7. The method of claim 6 wherein the second therapy is optionally selected from administration to the subject of one or more therapeutic compound, optionallly selected from the group consisting of hydroxyflutamide, leuprolide, megesterol, diethylstilbesterol, aminoglutethimide, spironolactone, tamoxifen, cyproterone acetate and bicalutamide.

8. The method of claim 1 wherein the formula 1 or formula 2 compound is an analog of 1, 3, 5(10)-estratriene-17α-ethynyl-3β,17β-diol, 17α-ethynyl-androstene-3β,17β-diol, 3β,17β-dihydroxy-androst-5-en-16-one, 3β,-methylcarbonate-androst-5-en-7,17-dione, wherein the analog comprises 1, 2, 3, 4, 5 or 6 independently selected moieties selected from an ester, a thioester, a sulfate ester, an ether, a thioether, a carbonate, a carbamate, a slufonamide, a

monosaccharide, a disaccharide, an oligosaccharide, an amino acid or a peptide, provided that at least one of these moieties is not an ester or an ether.

9. The method of claim 1 wherein the formula 1 or formula 2 compound comprises 1, 2, 3, 4, 5 or 6 moieties independently selected from -OH, =O, -SH, =S, $-NH_2$, halogen, $=CH_2$, =NOH, $=NOC(O)CH_3$, $-O-C(O)-(CH_2)_m-(CF_2)_n-CH_3$, $-O-C(O)-(CH_2)_m-(CF_2)_n-CF_3$, $-O-C(O)-(CH_2)_m-(CF_2)_n-CH_2F$, $-O-C(O)-O-(CH_2)_m-(CF_2)_n-CH_3$, $-O-C(O)-O-(CH_2)_m-(CF_2)_n-CF_3$, $-O-C(O)-O-(CH_2)_m-(CF_2)_n-CH_2F$, $-O-C(O)-NH-(CH_2)_m-(CF_2)_n-CH_3$, $-O-C(O)-NH-(CH_2)_m-(CF_2)_n-CF_3$, $-O-C(O)-NH-(CH_2)_m-(CF_2)_n-CH_2F$, wherein m is 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10, and n is 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10, $-CH(CH_3)-(CH_2)_2-C(O)NH-CH_2COOH$, $-CH(CH_3)-(CH_2)_2-C(O)NH-CH_2SO_3H$, $-OSi(CH_3)_2C(CH_3)_3$, $-C(OH)=CHCH_3$, $=CH(CH_2)_{0-15}CH_3$, $-(CH_2)_{0-14}CH_2F$, $-(CH_2)_{0-14}CH_2Cl$, $-(CH_2)_{0-14}CH_2Br$, $-(CH_2)_{0-14}CH_2I$, $-(CH_2)_{2-10}-O-(CH_2)_{0-4}CH_3$, $-(CH_2)_{2-10}-S-(CH_2)_{0-4}CH_3$, $-(CH_2)_{2-10}-NH-(CH_2)_{0-4}CH_3$, $-O-(CH_2)_{0-14}CH_2F$, $-O-(CH_2)_{0-14}CH_2Cl$, $-O-(CH_2)_{0-14}CH_2Br$, $-O-(CH_2)_{0-14}CH_2I$, $-O-(CH_2)_{2-10}-O-(CH_2)_{0-4}CH_3$, $-O-(CH_2)_{2-10}-S-(CH_2)_{0-4}CH_3$, $-O-(CH_2)_{2-10}-NH-(CH_2)_{0-4}CH_3$, $-O-C(O)-(CH_2)_{0-14}CH_2F$, $-O-C(O)-(CH_2)_{0-14}CH_2Cl$, $-O-C(O)-(CH_2)_{0-14}CH_2Br$, $-O-C(O)-(CH_2)_{0-14}CH_2I$, $-O-C(O)-(CH_2)_{2-10}-O-(CH_2)_{0-4}CH_3$, $-O-C(O)-(CH_2)_{2-10}-S-(CH_2)_{0-4}CH_3$, $-O-C(O)-(CH_2)_{2-10}-NH-(CH_2)_{0-4}CH_3$, $-O-C(S)-(CH_2)_{0-14}CH_2F$, $-O-C(S)-(CH_2)_{0-14}CH_2Cl$, $-O-C(S)-(CH_2)_{0-14}CH_2Br$, $-O-C(S)-(CH_2)_{0-14}CH_2I$, $-O-C(S)-(CH_2)_{2-10}-O-(CH_2)_{0-4}CH_3$, $-O-C(S)-(CH_2)_{2-10}-S-(CH_2)_{0-4}CH_3$, $-O-C(S)-(CH_2)_{2-10}-NH-(CH_2)_{0-4}CH_3$, $-(CH_2)_{0-16}NH_2$, $-(CH_2)_{0-15}CH_3$, $-(CH_2)_{0-15}CN$, $-(CH_2)_{0-15}CH=CH_2$, $-(CH_2)_{0-15}NHCH(O)$, $-(CH_2)_{0-16}NH-(CH_2)_{0-15}CH_3$, $-(CH_2)_{0-15}CCH$, $-(CH_2)_{0-15}OC(O)CH_3$, $-(CH_2)_{0-15}OCH(OH)CH_3$, $-(CH_2)_{0-15}C(O)OCH_3$, $-(CH_2)_{0-15}C(O)OCH_2CH_3$, $-(CH_2)_{0-15}C(O)(CH_2)_{0-15}CH_3$, $-(CH_2)_{0-15}C(O)(CH_2)_{0-15}CH_2OH$, $-O(CH_2)_{1-16}NH_2$, $-O(CH_2)_{1-15}CH_3$, $-O(CH_2)_{1-15}CN$, $-O(CH_2)_{1-15}CH=CH_2$, $-O(CH_2)_{1-15}NHCH(O)$, $-O(CH_2)_{1-16}NH-(CH_2)_{1-15}CH_3$, $-O(CH_2)_{1-15}CCH$, $-O(CH_2)_{1-15}OC(O)CH_3$, $-O(CH_2)_{1-15}OCH(OH)CH_3$, $-O(CH_2)_{1-15}C(O)OCH_3$, $-O(CH_2)_{1-15}C(O)OCH_2CH_3$, $-O(CH_2)_{1-15}C(O)(CH_2)_{0-15}CH_3$, $-O(CH_2)_{1-15}C(O)(CH_2)_{0-15}CH_2OH$, $-OC(O)(CH_2)_{1-16}NH_2$, $-OC(O)(CH_2)_{1-15}CH_3$, $-C(O)O(CH_2)_{1-15}CN$, $-C(O)O(CH_2)_{1-15}CH=CH_2$, $-OC(O)(CH_2)_{1-15}NHCH(O)$, $-OC(O)(CH_2)_{1-16}NH-(CH_2)_{1-15}CH_3$, $-OC(O)(CH_2)_{1-15}CCH$, $-OC(O)(CH_2)_{1-15}OC(O)CH_3$, $-OC(O)(CH_2)_{1-15}OCH(OH)CH_3$, $-OC(O)(CH_2)_{1-15}C(O)OCH_3$, $-OC(O)(CH_2)_{1-15}C(O)OCH_2CH_3$, $-OC(O)(CH_2)_{1-15}C(O)(CH_2)_{0-15}CH_3$, $-OC(O)(CH_2)_{1-15}C(O)(CH_2)_{0-15}CH_2OH$, $-C(O)-O-(CH_2)_mCH_3$ (where m is 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10), $-(CH_2)_m-C(O)OH$ (where m is 1,

2, 3, 4, 5, 6, 7, 8, 9 or 10), phosphoenolpyruvate, D-glucosamine, glucholic acid, glucuronic acid, pantothenic acid, pyruvic acid, glucose, fructose, mannose, rhamnose, fucose, sucrose, lactose, glycerol, 3-phosphoglycerate, glycine, alanine, phenylalanine, glutamic acid, lysine, threonine, proline, 4-hydroxyproline and a C_{4-22} fatty acid that is linear or branched and that is saturated or unsaturated, provided that at least one of these moieties is not an ester or an ether.

10. The method of claim 1 wherein

(a) R^{24} is $-CH_2OH$, $-CH_2-O-C(O)(CH_2)_{1-16}NH_2$, $-OC(O)(CH_2)_{1-15}CH_3$ or $-OC(O)(CH_2)_{1-15}CH_2OH$, or

(b) R^{25} is $-CH_2OH$, $-CH_2-O-C(O)(CH_2)_{1-16}NH_2$, $-OC(O)(CH_2)_{1-15}CH_3$ or $-OC(O)(CH_2)_{1-15}CH_2OH$, or

(c) R^1 is -OH, -SH, $-NH_2$, a halogen, $-O-C(O)-CH_3$, or $-O-C(O)-C_2H_5$, or

(d) R^1 and R^2 together are =O, =S, $=CH_2$, $=CHCH_3$, =NOH, $=NOC(O)CH_3$, or they are both -OH, or a halogen, or

(e) R^3 is -OH, -SH, $-NH_2$, a halogen, $-O-C(O)-CH_3$, or $-O-C(O)-C_2H_5$, or

(f) R^3 and R^4 together are =O, =S, $=CH_2$, $=CHCH_3$, =NOH, $=NOC(O)CH_3$, or they are both -OH, or a halogen, or

(g) R^7 is -OH, -SH, $-NH_2$, a halogen, $-O-C(O)-CH_3$, or $-O-C(O)-C_2H_5$, or

(h) R^7 and R^8 together are =O, =S, $=CH_2$, $=CHCH_3$, =NOH, $=NOC(O)CH_3$, or they are both -OH, or a halogen, or

(i) R^{10} is -OH, -SH, $-NH_2$, a halogen, $-O-C(O)-CH_3$, or $-O-C(O)-C_2H_5$, or

(j) R^{10} and R^{11} together are =O, =S, $=CH_2$, $=CHCH_3$, =NOH, $=NOC(O)CH_3$, or they are both -OH, or a halogen, or

(k) R^{14} is -OH, -SH, $-NH_2$, a halogen, $-O-C(O)-CH_3$, or $-O-C(O)-C_2H_5$, or

(l) R^{14} and R^{15} together are =O, =S, $=CH_2$, $=CHCH_3$, =NOH, $=NOC(O)CH_3$, or they are both -OH, or a halogen, or

(m) R^{16} is -OH, -SH, $-NH_2$, a halogen, $-O-C(O)-CH_3$, or $-O-C(O)-C_2H_5$, or

(n) R^{16} and R^{17} together are =O, =S, $=CH_2$, $=CHCH_3$, =NOH, $=NOC(O)CH_3$, or they are both -OH, or a halogen, or

(o) R^{20} is -OH, -SH, $-NH_2$, a halogen, $-O-C(O)-CH_3$, or $-O-C(O)-C_2H_5$, or

(p) R^{20} and R^{21} together are =O, =S, $=CH_2$, $=CHCH_3$, =NOH, $=NOC(O)CH_3$, or they are both -OH, or a halogen, or

(q) R^{22} is -OH, -SH, $-NH_2$, a halogen, $-O-C(O)-CH_3$, or $-O-C(O)-C_2H_5$, or

(r) R^{22} and R^{23} together are =O, =S, $=CH_2$, $=CHCH_3$, =NOH, $=NOC(O)CH_3$, or they are both -OH, or a halogen, or

(s) R^{24} is -OH, -SH, $-NH_2$, a halogen, $-O-C(O)-CH_3$, or $-O-C(O)-C_2H_5$, or

(t) R^{24} and R^{28} together are =O, =S, $=CH_2$, $=CHCH_3$, =NOH, $=NOC(O)CH_3$, or they are both -OH, or a halogen, or

(u) R^{26} is -OH, -SH, $-NH_2$, a halogen, $-O-C(O)-CH_3$, or $-O-C(O)-C_2H_5$, or

(v) R^{26} and R^{27} together are =O, =S, $=CH_2$, $=CHCH_3$, =NOH, $=NOC(O)CH_3$, or they are both -OH, or an independently selected halogen or they are both the same halogen.

add A'

add B'